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# Mirror Therapy & Motor Function with Chronic Stroke

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# Mirror Therapy & Motor Function with Chronic Stroke

Elise Grubb & Sara Ponischil, Occupational Therapy Students

## Aim of this CAT

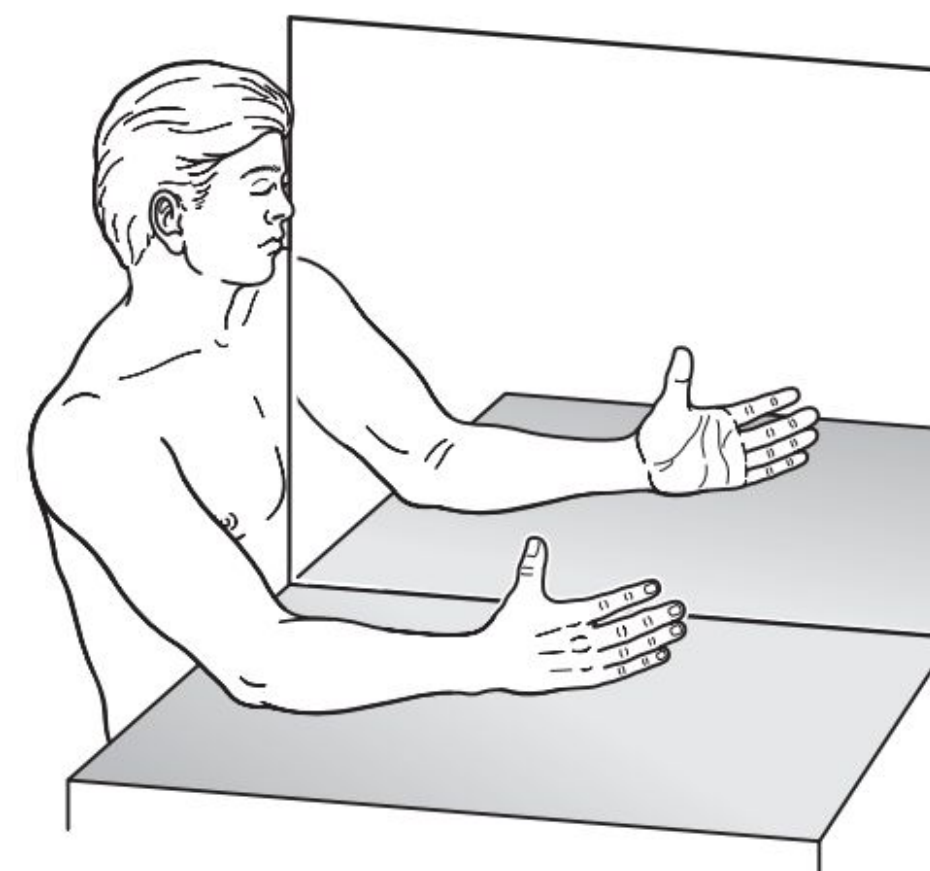
Existing literature provides evidence for mirror therapy interventions during the *subacute* stage of stroke; the purpose of this CAT is to discover evidence for mirror therapy during the *chronic* stage of stroke.

## Case Scenario

Male, 63, right-sided chronic stroke with moderate left hemiparesis

## Mirror Therapy Defined

Mirror therapy is a therapeutic intervention using the motions of the unaffected side of the body, reflected in a mirror, as visual feedback; this feedback enables bilateral motor training and stimulates functional improvement of the brain.<sup>1</sup>



**Photo**<sup>8(p453)</sup>: The patient's paretic arm is hidden behind the mirror. He moves his unaffected arm and watches the reflection. The patient is asked to try the same movements with the hidden paretic arm.

## 1 Ask: Research Question

Is mirror therapy an effective intervention to improve motor function in the affected upper extremity of chronic stroke patients in an outpatient setting?

## 2a Acquire: Search Terms

**Databases:** Cochrane Library, MEDLINE, PubMed, ClinicalKey

**Search Terms:** mirror therapy, stroke, upper extremity motor function

## 2b Acquire: Selected Articles

Randomized control trial comparing mirror therapy vs. passive mobilization for participants with chronic stroke at a neurorehabilitation outpatient clinic in Valencia, Spain.<sup>1</sup>

Randomized control trial comparing mirror therapy vs. conventional exercises for participants with chronic stroke at an outpatient clinic in Gyeonggi Province, South Korea.<sup>2</sup>

Randomized control trial comparing mirror therapy vs. bilateral arm training for participants with chronic stroke at an outpatient clinic in Rotterdam, the Netherlands.<sup>3</sup>

## 3a Appraise: Study Quality

All 3 randomized control trials are Level I evidence with proper randomization, concealment of allocation, and with blind and trained assessors; all operations are defined.<sup>1, 2, 3</sup>

Small n-size (n=33), mean age=53.5; MMSE>23. Random assignment to either 45 minutes of mirror therapy (n=17) or passive mobilization of upper limb (n=16).<sup>1</sup> Motor function assessed at 8 months after baseline<sup>1</sup>:

- Wolf Motor Function test - *excellent reliability and validity*<sup>4</sup>
- Fugl-Meyer Assessment - *excellent reliability and validity*<sup>5</sup>
- Other: Nottingham Sensory Assessment

Small n-size (n=25), mean age=49.1; MMSE>24.<sup>2</sup> Random assignment to either 30 minutes of mirror therapy (n=12) or conventional exercises (n=13).<sup>2</sup> Motor function assessed at 4 weeks after baseline<sup>2</sup>:

- Fugl-Meyer Assessment - *excellent reliability and validity*<sup>5</sup>
- Action Research Arm test - *excellent reliability, moderate validity*<sup>6</sup>
- Box and Block test - *excellent reliability and validity*<sup>7</sup>
- Other: Functional Independence Measure

Medium n-size (n=40), mean age=57; no cognitive criteria.<sup>3</sup> Random assignment to either 60 minutes of mirror therapy (n=12) or bilateral arm training (n=13).<sup>3</sup> Motor function assessed at 6 weeks after baseline<sup>3</sup>:

- Fugl-Meyer Assessment - *excellent reliability and validity*<sup>5</sup>
- Action Research Arm test - *excellent reliability, moderate validity*<sup>6</sup>
- Subgroup (n=23) assessed by fMRI to map cortical reorganization<sup>3</sup>
- Other: Tardieu scale, ABILHAND questionnaire, Stroke-ULAM

## 3b Appraise: Study Results

These 3 studies included a total of 99 participants that compared mirror therapy to 3 other interventions. We found high-quality evidence that mirror therapy has a significant positive effect on motor function for patients with chronic stroke<sup>1, 2, 3</sup>:

- Wolf Motor Function test - **significant improvement** in subscales for time (p=.002) and ability (p=.001)<sup>1</sup>
- Fugl-Meyer Assessment - no significant difference<sup>1</sup>
- Nottingham Sensory Assessment - **significant improvement**<sup>1</sup>
- Fugl-Meyer Assessment - **significant improvement**<sup>2</sup>
- Action Research Arm test - **significant improvement**<sup>2</sup>
- Box and Block test - **significant improvement**<sup>2</sup>
- Functional Independence Measure - **significant improvement**<sup>2</sup>
- Fugl-Meyer Assessment - **significant improvement**<sup>3</sup>
- Action Research Arm test - no significant difference<sup>3</sup>
- fMRI results showed a **shift in activation balance** within the primary motor cortex (p<.05)<sup>3</sup>

## 4 Apply: Conclusions for Practice

Mirror therapy is an effective intervention to improve motor function in the affected upper extremity of chronic stroke patients in an outpatient setting<sup>1, 2, 3</sup>. This is a cost-effective approach that can also be performed in independently as part of a home program.<sup>8</sup>

## Reference List:

1. Colomer C, Noé E, Llorens R. Mirror therapy in chronic stroke survivors with severely impaired upper limb function: a randomized controlled trial. *European Journal of Physical and Rehabilitation Medicine*. 2016;52(3):271–8.
2. Kim K, Lee S, Kim D, Lee K, Kim Y. Effects of mirror therapy combined with motor tasks on upper extremity function and activities daily living of stroke patients. *Journal of Physical Therapy Science*. 2016;28(2):483–7.
3. Michielsen ME, Selles RW, Van der Geest JN, Eckhardt M, Yavuzer G, Stam HJ, et al. Motor recovery and cortical reorganisation after mirror therapy in chronic stroke patients: a phase II randomized controlled trial. *Neurorehabilitation and Neural Repair* 2011;25(3):223–33. DOI: 10.1177/1545968310385127; PUBMED: 21051765
4. Wolf Motor Function Test. strokeengine.ca. www.strokeengine.ca/en/assess/wmft/. Published November 1, 2011. Accessed March 14, 2018.
5. Fugl-Meyer Assessment of Motor Recovery After Stroke. sralab.org. www.sralab.org/rehabilitation-measures/fugl-meyer-assessment-motor-recovery-after-stroke. Published August 2, 2016. Accessed March 14, 2018.
6. Action Research Arm Test. sralab.org. www.sralab.org/rehabilitation-measures/action-research-arm-test. Published April 4, 2016. Accessed March 14, 2018.
7. Box and Block Test. sralab.org. www.sralab.org/rehabilitation-measures/box-and-block-test. Published April 26, 2012. Accessed March 14, 2018.
8. Gillen, G. *Stroke rehabilitation: A function-based approach*. 4th ed. St Louis, MO: Mosby, Inc.; 2016.

**Mirror therapy is an effective intervention to improve motor function in the affected upper extremity of patients with chronic stroke.**

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